Commencement Address Winter 2004

Delivered by Lonnie G. Thompson, Distinguished University Professor in The Ohio State University Department of Geological Sciences and research scientist at the Byrd Polar Research Center

Thank you President Holbrook, members of the Board of Trustees, distinguished guests, fellow faculty members, graduating students and our very special guests: the parents, friends and loved ones of our students,

It is an honor to address you this afternoon on this very important day when your collective accomplishments at OSU are acknowledged by the receipt of your diploma. 28 years ago, I, like you, received my diploma from The Ohio State University and embarked upon my career that has included 47 expeditions to the highest mountains in 15 countries. At these times, my team members and I endured harsh conditions living for months in very remote locations, far from the basic comforts we often take for granted such as warmth, cleanliness, easily available food and communication with those at home.

The challenges that I have faced over the years to recover ice cores from the world's highest mountains are analogous in many ways to those you will face as you climb your own mountains and seek your destiny - whatever that may be. From personal experience, I know that the mountainous terrain ahead can seem daunting at times, but it is by meeting and overcoming hardships that you confront your strengths and weaknesses, your beliefs and your fundamental values and thereby gain a much better sense of self. You are setting out to climb your mountains and in so doing you will touch the lives of others in positive ways and contribute your time and talents to make the world a better place for all.
I want to share with you four lessons learned while climbing my mountains, both real and symbolic. I will highlight these lessons by sharing a story from the early days of my career.

***Lesson Number 1:* Expect to experience failure – learn to turn it into success.**
I know this from personal experience. Back in 1973, when I first started thinking about drilling ice cores on tropical mountains, I was still a graduate student in Geological Sciences here at OSU. This began as an idea that emerged from discussions with an older and esteemed colleague at the Byrd Polar Research Center. He showed me a photo of a glacier, called the Quelccaya ice cap, that he had encountered while studying the glacial

history in the Andes mountains of southern Peru. My eyes were drawn to the ice cap and the striking dust layers, one upon another, just like a multi-layered cake, with a new layer added to the top by each year's snowfall. I pondered whether these layers of snow and ice might contain a history of the climate variations in this remote region.

At the time, like so many others in glaciology, I was analyzing ice cores from Antarctica and Greenland, to reconstruct the Earth's climate history. No one had yet considered whether it was feasible that tropical ice caps might also contain climate information. Yet the challenge of recovering the first tropical ice cores from elevations near 19,000 feet in the Andes just would not go away and began to consume my attention. Although the safer career path might have been to continue with polar ice cores, I decided to switch gears. I approached the National Science Foundation (called the NSF) to obtain funds for a preliminary investigation of the Quelccaya ice cap, but quickly it was obvious that neither the NSF nor any other federal agency had programs specifically to fund work on ice cores outside the polar regions, and certainly not for ice caps and glaciers in the tropics.

Disappointed and stinging from this failure, I went off to Antarctica to continue my work. While there, a telegram arrived from the NSF saying that they had funded all the "real science projects" and that $7000 was left in their budget - Would I be interested? Yeah, sure, but how on Earth could we drill an ice core on a tropical mountain with $7000? Well, I thought, $7000 would at least get us there - which it did. We collected some surface samples on the glacier, brought them back to Ohio State, and discovered from this little bit of ice key evidence that Quelccaya did indeed have the potential to preserve a climate history. Moreover, the ice cap also contained signals of something the Peruvians called El Nino, which, at that time, was fairly unknown except by those working and living in Peru. Ah - and then serendipity struck! Just as we found evidence of El Nino on Quelccaya, the NSF created a new department that was willing to fund ice core research outside Antarctica and Greenland. And then good luck - they accepted our proposal to drill all the way through the Quelccaya ice cap - even though such a drilling project had never been attempted. Thus, here we were with our $7000 worth of samples and our preliminary findings just as more federal money became available for ice coring in the tropics.

- This is an example of being in the right place at the right time. Clearly, the first failure of my career actually resulted in my first success - gaining funds to drill the first tropical ice cores.

But my joy was short-lived and I was young and naive. My team and I took the same huge drill that we had used in Antarctica and flew it to Peru, where we contracted a helicopter from the Peruvian Air Force to fly us and our drill up to the top of the ice cap at almost 19,000 feet. This would be so much easier than using horses to carry 6 tons of equipment from the nearest road to the base of the ice cap, a 2-day journey at best. Moreover, the drill was too heavy for the horses. But as bad luck would have it, the top of Quelccaya was too high for the helicopter and it could not land there.

So here we were faced with two choices: admit defeat, give up the dream of working on tropical ice cores, and return working in the polar regions, or stay with it and explore other options to solve the problem. We chose option two and decided to build a new light-weight drill driven by solar power that could be broken into smaller pieces and carried by horses to the edge of the ice. From there everything would be backpacked to the summit drill site. What a great idea! We had now turned our failure into a plan that I felt guaranteed success.

<u>This brings us to Lesson #2:</u> Those who question your ability may do you a greater service than those who offer faint praise. By meeting challenges head on, you will become sharper and more competitive!

So now back to the Quelccaya story! The next challenge was to convince NSF to fund this wild idea - and NSF had money so we submitted a proposal. Then we were dealt a serious setback when one of the world's pioneers in polar ice core drilling (let's call him Willi) reviewed the proposal and reported that he believed the Quelccaya ice cap was too high for humans to live there long enough to drill an ice core to bedrock. Willi also pointed out that the technology did not even exist to drill the ice cap! This was a devastating blow!

Again serendipity intervened! A new young program director at NSF had a special interest in studying monsoon climates and he decided that there was an outside chance that tropical ice cores might have potential. Luckily, he gave us an opportunity to test the

frontiers of ice core drilling. We were on our way! That early criticism from an icon in my field of study served to solidify my resolve to overcome the many obstacles that lay ahead. In fact, it took us the next 4 years to design, test, then redesign and retest our new solar powered ice core drill - the first in the world. Actually very few people believed that our drill would work!

***Now that brings us to Lesson #3:** Believe in yourself, but be flexible and seize any opportunity that creates other options.*

Although I was upset and still stinging from the criticism of the senior scientist who had doubted our ability to recover tropical ice cores, I held my tongue. Given his extensive experience and success in drilling the polar ice caps, I entertained the thought that there could be a remote chance that he just might be right. Now that didn't stop us from taking the money from NSF and building our drill, but just to cover my bases in 1983, before leaving for Peru on the trip that would determine the ultimate direction of the rest of my life, I took the exam to enter the MBA program at OSU. Fortunately, there was no need to pursue that option since our team and equipment made it to the top of the ice cap and we drilled the first two ice cores to bedock from a tropical ice cap. Moreover, the OSU team was the first to use solar power to drive an ice core drill.

Upon returning to OSU I contacted Willi and asked if he would like to join us in analyzing the Quelccaya ice cores - he graciously accepted and he also admitted that he had been wrong in his assessment of our proposal. This lead to a long and productive collaboration that lasted for decades.

The Quelccaya ice core drilling project took nine years to complete: it started in 1974 with a "wild" idea and was successfully completed in 1983 with international recognition. From this rather rocky launching pad - the Ice Core Paleoclimate Research Group developed at the Byrd Polar Research Center. Since that time we have successfully completed many such expeditions with the continued support of both federal agencies and Ohio State.
The ultimate task is: to fail, to learn, and to start over; to fall, to reflect and to rise again. Reaching your goals must become a habit.

I have always believed that one of the most important things that any person can do in life is to figure out what it is he or she wants to do more than anything else and then work to accomplish it. That's a long-winded way of saying that it's important to determine your life's goal. I did this over 25 years ago. It seems to have worked. Most of you have or still are struggling with this, and it can be draining, both emotionally and financially, as many of the parents here can testify.

But it doesn't have to be a cosmically lofty goal, such as being as rich as Bill Gates or as powerful as Alan Greenspan. But it should be something that you find satisfying and fulfilling and brings you joy. But whatever it is, write it down, put it in a drawer, and pull it out every so often and think about it, especially at times when you run up against your own personal mountains. Remember your purpose and it will serve you as your focus to help you make choices along the way. But as you move toward your goal, remember to bring a few things with you:

1) courage to challenge both yourself and those around you

2) persistence

3) the flexibility to see things in new ways

4) willingness to work hard

5) a strong trust in your instincts and insights.

Success and happiness in life will come only when you find a purpose that extends beyond yourself. It means knowing not only how to do what you do well, but also why you are doing it!

Lesson 4: Appreciate that we share a common humanity.

I have had the opportunity to travel and work in many countries and learn from many peoples and cultures. At elevations over 20,000 feet when it is cold, windy, food is low and the work is hard, the masks come off and an individual's true spirit is laid bare. In this lies my abiding belief in the goodness and greatness of the human spirit. We have worked together under the best of conditions and under the worst, most extreme conditions. In this era of increasing international tension and suspicions, I encourage you all get to know other citizens of our world community. I believe that this is a good way to build understanding, trust and a sense of community, something that is particularly in short

"It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow."

We at The Ohio State University wish you success and happiness. Remember it is truly a magnificent world, let's all do what we can to protect it!

Thank you! **Remarks by Lonnie G. Thompson 03/21/2004**